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Title: Upsilon invariant for graphs and homology cobordism group of homology cylinders

Abstract: Upsilon is an invariant of knots defined using knot Floer homology by Ozsváth, Szabó and Stipsicz. In this talk, we discuss a generalization of their invariant for embedded graphs in rational homology spheres satisfying specific properties. Our construction will use a generalization of Heegaard Floer homology for "*generalized tangles*" called tangle Floer homology. As a result, we get a family of homomorphisms from *the homology cobordism group of homology cylinders* (over a surface of genus 0), which is an enlargement of the mapping class group defined by Graoufaldis and Levine.